

Amendments to the Claims

Please cancel claim 1. Please amend claims 2-8, 10, 12 and 14. Please add new claims 16-29. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Canceled)
2. (Currently amended) A method ~~as in Claim 1 additionally comprising the steps of, for~~ processing access channel signals in a digital wireless communication system comprising the steps of:
 - at a transmitter,
 - encoding pilot symbols throughout a preamble portion of an access channel frame of information to be transmitted on the access channel; and
 - encoding data symbols in a payload portion of the access channel frame, the payload portion of the access channel frame also including pilot symbols interleaved with the data symbols, the preamble portion of the access channel frame preceding the payload portion;
 - at a receiver,
 - obtaining a pilot symbol phase estimate by feeding the pilot symbols in the preamble portion to a pilot correlation filter;
 - obtaining a data symbol estimate by feeding the data symbols in the payload portion to a data symbol correlator; and
 - using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.
3. (Currently amended) A method as in Claim 2 or 16 additionally comprising the steps of, at a receiver:
 - extracting pilot symbols from the payload portion; and
 - performing a cross product operation with the pilot symbols embedded in the payload portion and the data symbols.

4. (Currently amended) A method as in Claim 2 or 16 additionally comprising the steps of,
at the receiver,
extracting pilot symbols from the payload portion; and
performing a cross product operation between the pilot symbols
embedded in the payload portion and the data symbols output by the data symbol
correlator.
5. (Currently amended) A method as in Claim [[1]] 2 or 16 wherein the pilot symbols are
interspersed at regular intervals in the payload portion.
6. (Currently amended) A method as in Claim 2 or 16 wherein the receiver is located at a
base station, and the transmitter is located at one of a plurality of field units serviced by
the base station at the same time.
7. (Currently amended) A method as in Claim 2 or 16 additionally comprising the steps of:
detecting the pilot symbols in the preamble portion with a pilot
correlation matched filter having a transfer function matched to the pilot
symbols.
8. (Currently amended) A method as in Claim 2 or 16 additionally comprising the steps of:
detecting the data symbols in the payload portion with a data correlation
matched filter having a transfer characteristic matched to the data symbols.
9. (Previously presented) A method for processing access channel signals in a digital
wireless communication system comprising:
at a transmitter,
encoding pilot symbols in a preamble portion of an access channel
frame of information to be transmitted on the access channel; and

encoding data symbols in a payload portion of the access channel frame, the payload portion of the access channel frame also including pilot symbols interleaved with the data symbols; and
at a receiver,

operating a pair of pilot correlation matched filters to detect the pilot symbols in the preamble portion, the pilot correlation matched filters operating in ping pong such that one of the pilot correlation matched filters is processing a received signal while the other is loading filter coefficients;

obtaining a pilot symbol phase estimate by feeding the pilot symbols in the preamble portion to a pilot correlation filter;

obtaining a data symbol estimate by feeding the data symbols in the payload portion to a data symbol correlator; and

using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.

10. (Currently amended) A method as in Claim 2 or 16 additionally comprising the steps of:
 - receiving a payload portion sequence of pilot symbols and data symbols;
 - separating the payload portion sequence into pilot symbols and data symbols using synchronization information derived from the pilot symbols in the preamble portion; and
 - comparing the separated pilot symbols and data symbols to detect information received.
11. (Original) A method as in Claim 10 wherein the step of comparing the separated pilot symbols and data symbols comprises performing a dot product of the separated pilot symbols and data symbols.
12. (Currently amended) A method as in Claim 2 or 16 additionally comprising the step of, at the receiver,
 - feeding a received preamble portion to a pilot correlation matched filter; and
 - comparing the output of the correlation matched filter to a peak detector.

13. (Original) A method as in Claim 12 additionally comprising the step of:
 - determining a time position of a plurality of peaks in the peak detector output; and
 - setting a plurality of rake receivers to each of the detected peaks.
14. (Currently amended) A method as in Claim [[1]] 2 wherein encoding pilot symbols throughout the preamble portion of the access channel frame further comprises:
 - encoding alternating blocks of pilot symbols and predetermined code sequences throughout the preamble portion of the access channel frame.
15. (Previously presented) A method as in Claim 14 wherein the predetermined code sequences are Barker code sequences.
16. (New) A method for processing access channel signals in a digital wireless communication system comprising at a receiver:
 - receiving an access channel frame of information on the access channel, the access channel frame comprising a preamble portion preceding a payload portion, the preamble portion of the frame comprising pilot symbols encoded throughout the preamble portion, the payload portion comprising pilot symbols interleaved with encoded data symbols;
 - obtaining a pilot symbol phase estimate by feeding the pilot symbols in the preamble portion to a pilot correlation filter;
 - obtaining a data symbol estimate by feeding the data symbols in the payload portion to a data symbol correlator; and
 - using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.
17. (New) A system for processing access channel signals in a digital wireless communication system comprising:
 - at a transmitter,
 - a processor encoding pilot symbols throughout a preamble portion of an access channel frame of information to be transmitted on the access channel; and

the processor encoding data symbols in a payload portion of the access channel frame, the payload portion of the access channel frame also including pilot symbols interleaved with the data symbols, the preamble portion of the access channel frame preceding the payload portion;

at a receiver,

a pilot correlation filter and a data symbol correlator receiving the access channel frame of information on the access channel;

a pilot correlation filter obtaining a pilot symbol phase estimate from the pilot symbols in the preamble portion of the access channel frame;

the data correlation filter obtaining a data symbol estimate from the data symbols in the payload portion of the access channel frame; and

the data correlation filter using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.

18. (New) A system as in Claim 17 additionally comprising at the data correlation filter:
 - an impulse response filter extracting pilot symbols from the payload portion; and
 - a multiplier performing a cross product operation with the pilot symbols embedded in the payload portion and the data symbols.
19. (New) A system as in Claim 17 wherein the pilot symbols are interspersed at regular intervals in the payload portion.
20. (New) A system as in Claim 17 wherein the receiver is located at a base station, and the transmitter is located at one of a plurality of field units serviced by the base station at the same time.
21. (New) A system as in Claim 17 additionally comprising at the pilot correlation filter of the receiver:
 - a pilot correlation matched filter having a transfer function matched to the pilot symbols in the preamble portion for detecting the pilot symbols in the preamble portion.

22. (New) A system as in Claim 17 additionally comprising at the data correlation filter of the receiver:
- a data correlation matched filter having a transfer characteristic matched to the data symbols in the payload portion for detecting the data symbols in the payload portion.
23. (New) A system for processing access channel signals in a digital wireless communication system comprising:
- at a transmitter,
 - a processor encoding pilot symbols in a preamble portion of an access channel frame of information to be transmitted on the access channel; and
 - the processor encoding data symbols in a payload portion of the access channel frame, the payload portion of the access channel frame also including pilot symbols interleaved with the data symbols; and
 - at a receiver,
 - a pair of pilot correlation matched filters operable to detect the pilot symbols in the preamble portion, the pilot correlation matched filters operating in ping pong such that one of the pilot correlation matched filters is processing a received signal while the other is loading filter coefficients;
 - a pilot correlation filter obtaining a pilot symbol phase estimate from the pilot symbols in the preamble portion;
 - a data symbol correlator obtaining a data symbol estimate from the data symbols in the payload portion; and
 - the data symbol correlator using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.

24. (New) A system as in Claim 17 additionally comprising at the data correlation filter of the receiver:
 - a data correlation matched filter receiving a payload portion sequence of pilot symbols and data symbols;
 - a switch controlled by a data decoder controller for separating the payload portion sequence into pilot symbols and data symbols using synchronization information derived from the pilot symbols in the preamble portion; and
 - a multiplier performing a dot product of the separated pilot symbols and data symbols to detect information received.
25. (New) A system as in Claim 17 additionally comprising at the pilot correlation filter of the receiver:
 - a pilot correlation matched filter receiving the preamble portion; and
 - a peak detector comparing the output of the correlation matched filter.
26. (New) A system as in Claim 25 additionally comprising at the receiver:
 - an impulse response filter determining a time position of a plurality of peaks in the peak detector output; and
 - a plurality of rake receivers being set to each of the detected peaks.
27. (New) A system as in Claim 17 wherein the processor at the transmitter encodes alternating blocks of pilot symbols and predetermined code sequences throughout the preamble portion of the access channel frame.
28. (New) A system as in Claim 27 wherein the predetermined code sequences are Barker code sequences.
29. (New) A wireless receiver for processing access channel signals in a digital wireless communication system, comprising:
 - a pilot correlation filter;
 - a data symbol correlator;

the pilot correlation filter and the data symbol correlator receiving an access channel frame of information on an access channel, the access channel frame comprising a preamble portion preceding a payload portion, the preamble portion of the frame comprising pilot symbols encoded throughout the preamble portion, the payload portion comprising pilot symbols interleaved with encoded data symbols;

the pilot correlation filter generating a pilot symbol phase estimate from the pilot symbols in the preamble portion;

the data symbol correlator generating a data symbol estimate from the data symbols in the payload portion; and

the data symbol correlator using the pilot symbol phase estimate provided by the pilot correlation filter to synchronize detection of the data symbols.